Iowa Water Quality

2003 Regional Meetings

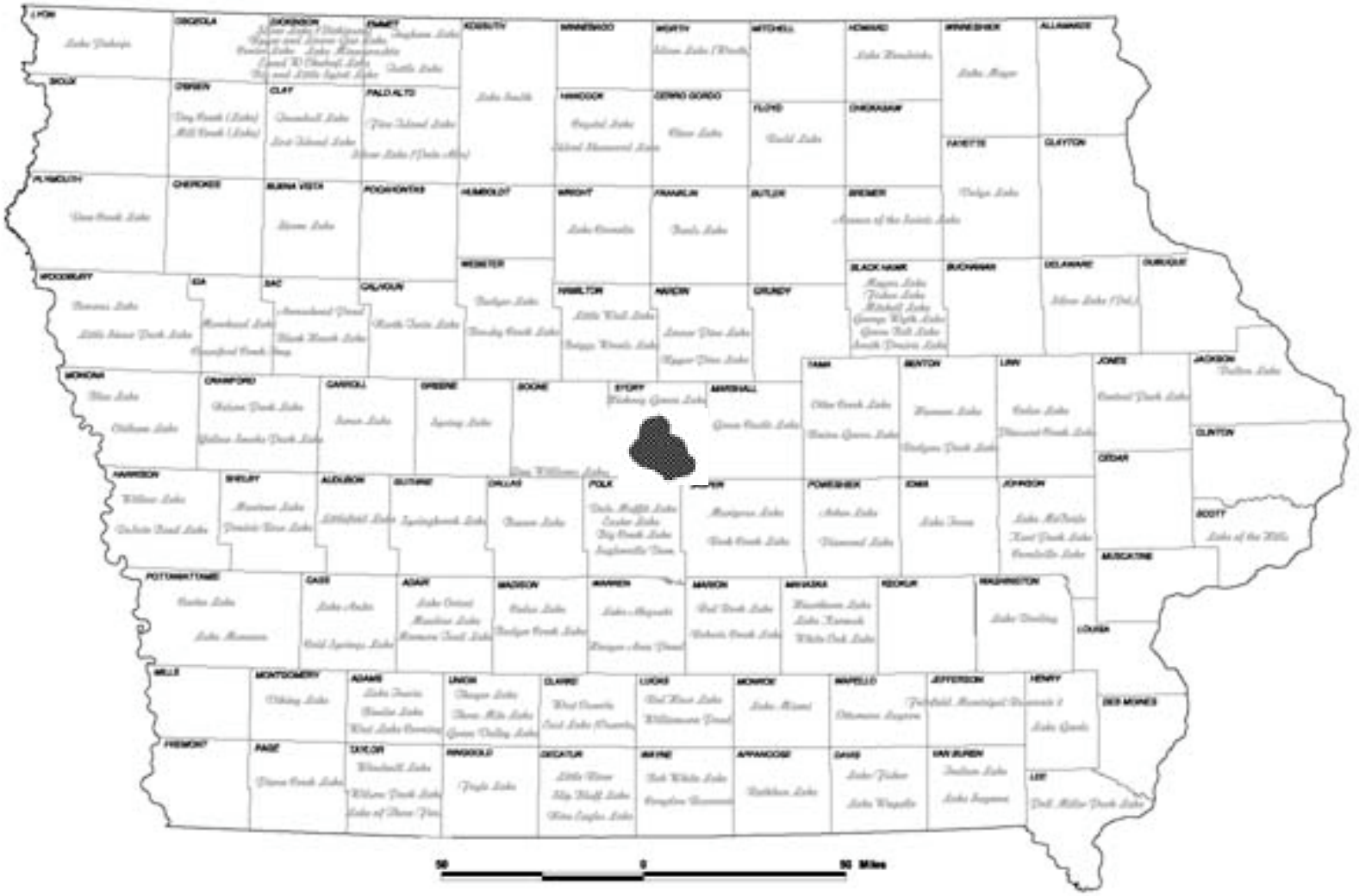
Iowa's Water Resources

- Rivers & Streams
  - Perennial streams - 26,630 miles
  - Intermittent streams - 42,957 miles
  - Border rivers - 660 miles

Iowa's Water Resources

- Lakes, reservoirs, ponds & wetlands
  - 5,432 water bodies
  - 161,366 acres

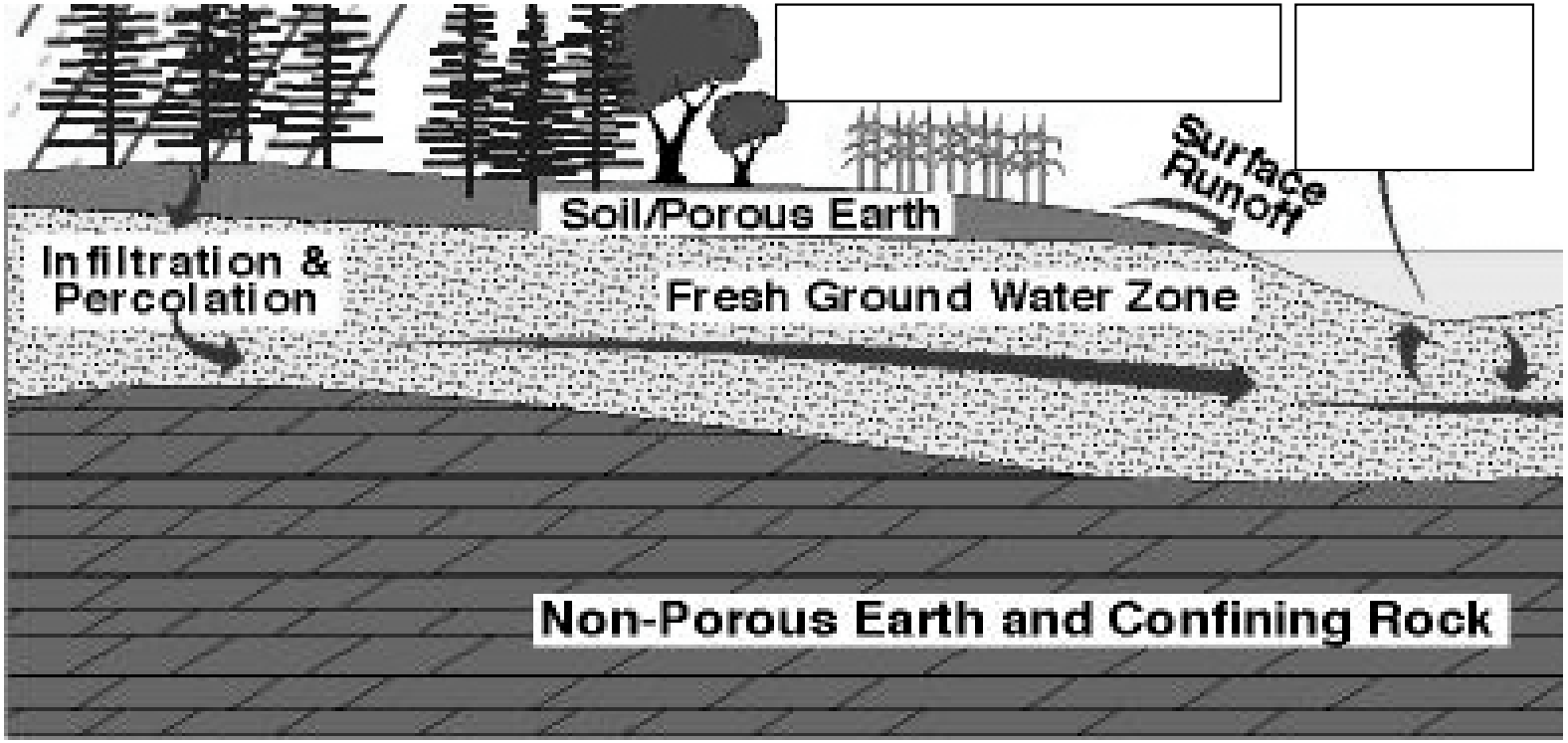
If All of Our Public Lakes...



Were in Just One Spot

Groundwater - our underground lakes

- Ground water quantity and quality varies across the state

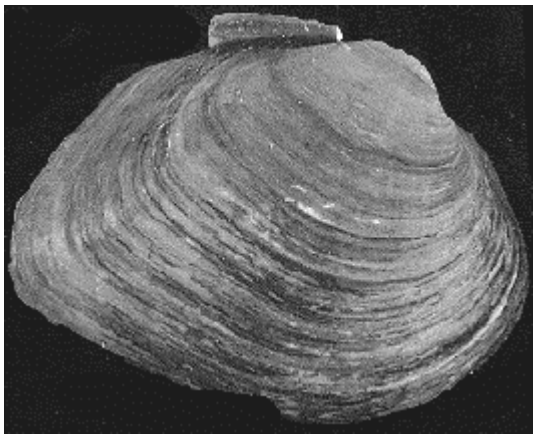


Shallow aquifers are more vulnerable to

Iowa is considered a "water rich" state, but …

- Not a lot of surface water - lakes, streams and rivers
- Groundwater resources - often limited
  - quantity
  - quality
- Water recreation and availability - important
  - quality of life
  - economic development
- It pays to protect and improve

Everyone Wants Clean Water

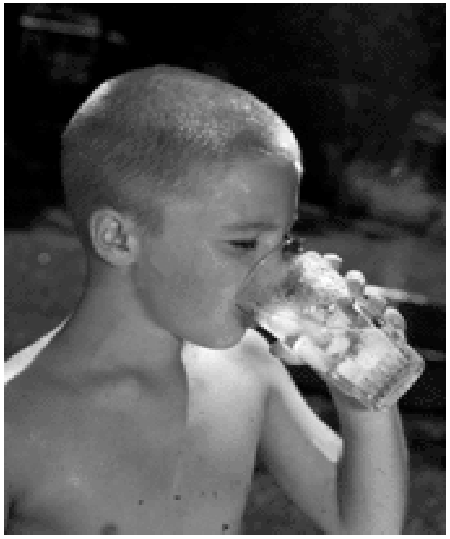


But what does “clean” mean?

Not all people agree what makes good water quality

A drinking water plant operator…..

- Able to meet drinking water standards (MCLs) with conventional treatment
- Should not have to use expensive treatment such as nitrate removal



A swimmer…

- Clear water
- Low risk of getting sick from swallowing or contact

Angler…

- Plentiful and diverse supply of game fish

Even the professionals have differing opinions of good and bad water quality

John Olson, DNR water quality staff

What water body represents the best water quality in Iowa and why?

If forced to choose one river as having the "best" water quality, I would pick the West Fork Cedar River in Butler and Franklin counties. In terms of chemical, physical and biological quality, this river appears better than most.

Richard Kelley,
Hygienic Lab

What body of water represents the worst water quality in Iowa and why?

Just about every interior stream in the State.

Dr. Roy Overton

What body of water represents the worst water quality in Iowa and why?

Probably the Mississippi River.... It carries the nitrates to the Gulf and when we track cancer of the kidneys and bladder it reflects the increased pollution of the river.

Richard Kelley, Hygienic Lab

What body of water represents the best water quality in Iowa and why?

The answer I want to give…….is the Mississippi. The Mississippi supports a larger, more diverse population than any other body of water in the State.

… Perhaps, it's not the best water quality as much as it has the greatest potential.

If even the experts can't agree, how do we measure "good" versus "bad" water quality

Two tools for evaluating water quality

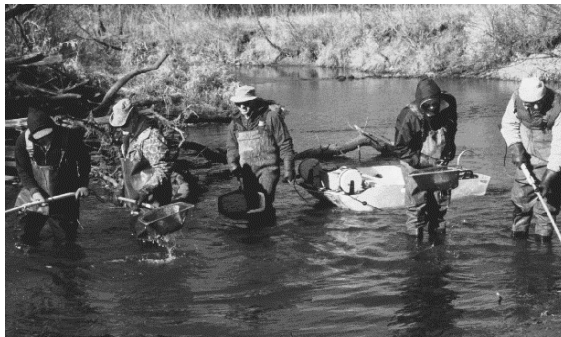
- Monitoring
- Water quality standards

Chemical & physical analysis

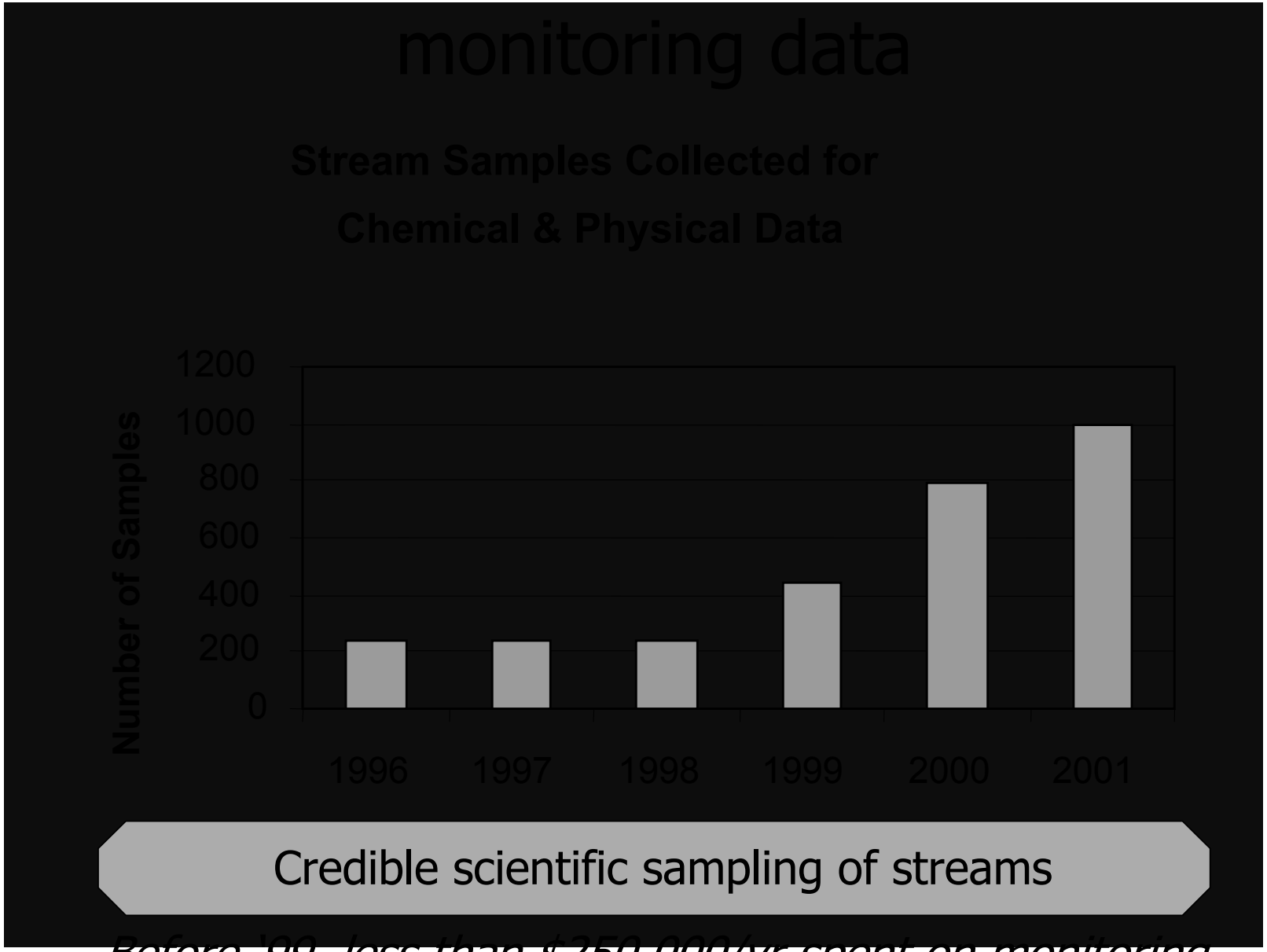
- Temperature, dissolved oxygen, pH, suspended solids
- Chemical analysis - ammonia, pesticides, chemicals, bacteria, etc.

Biological analysis

- Measuring the "aquatic health"
- Fish numbers and diversity
- Aquatic "bugs"
- Fish tissue testing



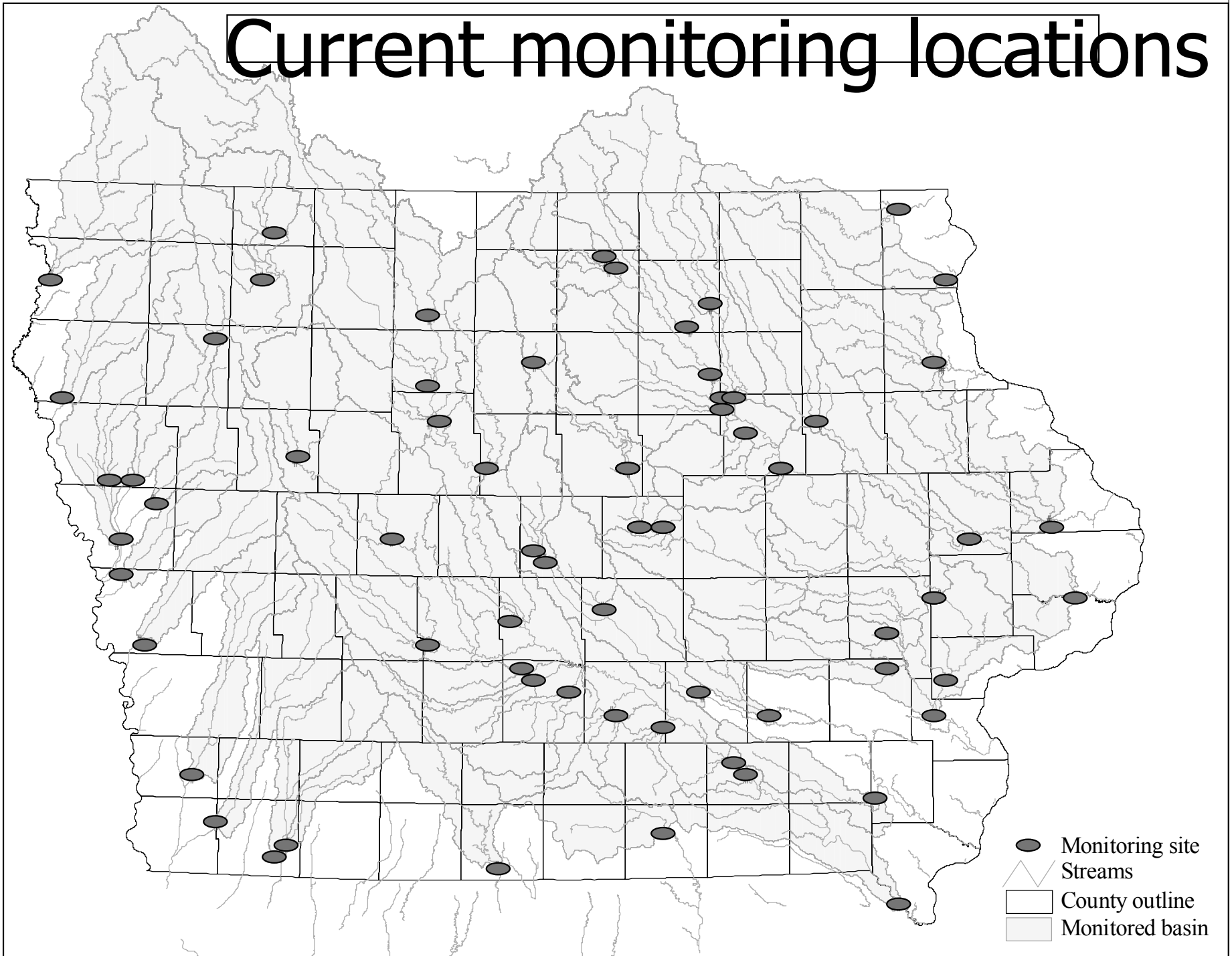
We don’t have a lot of historic monitoring data



Credible scientific sampling of streams

Before ‘99, less than $250,000/yr spent on monitoring

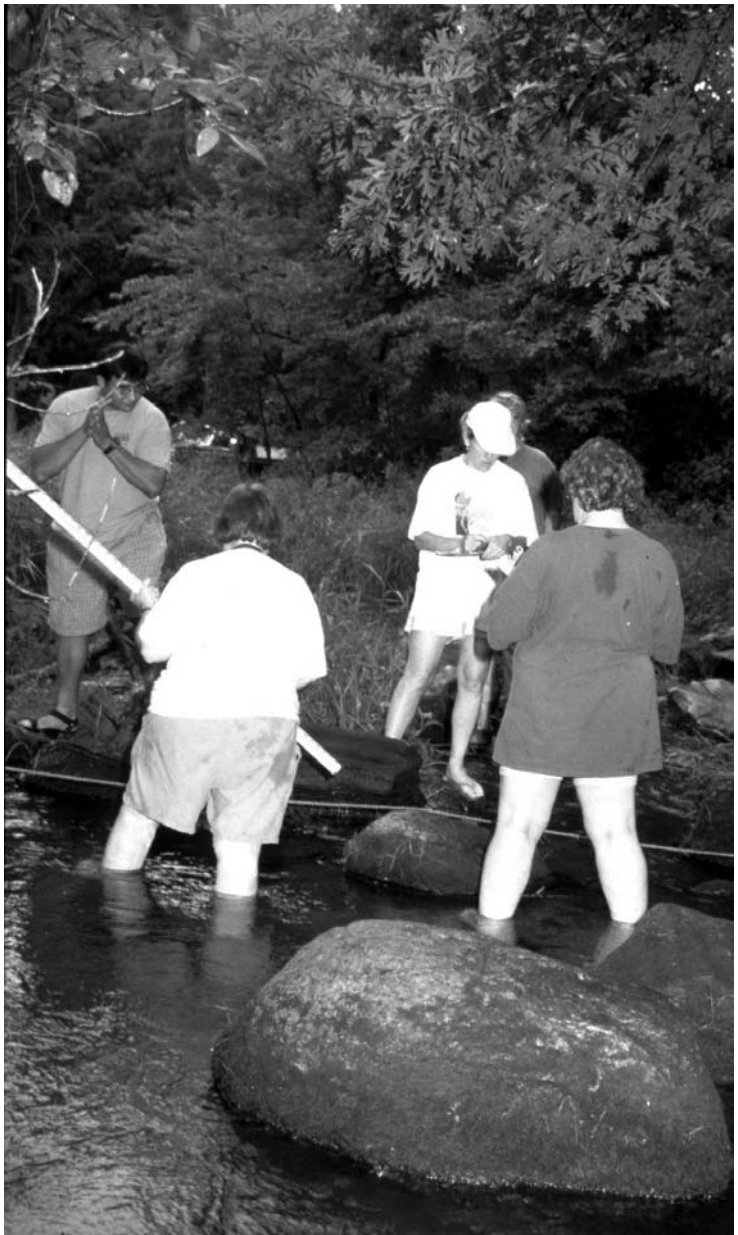
Current monitoring locations



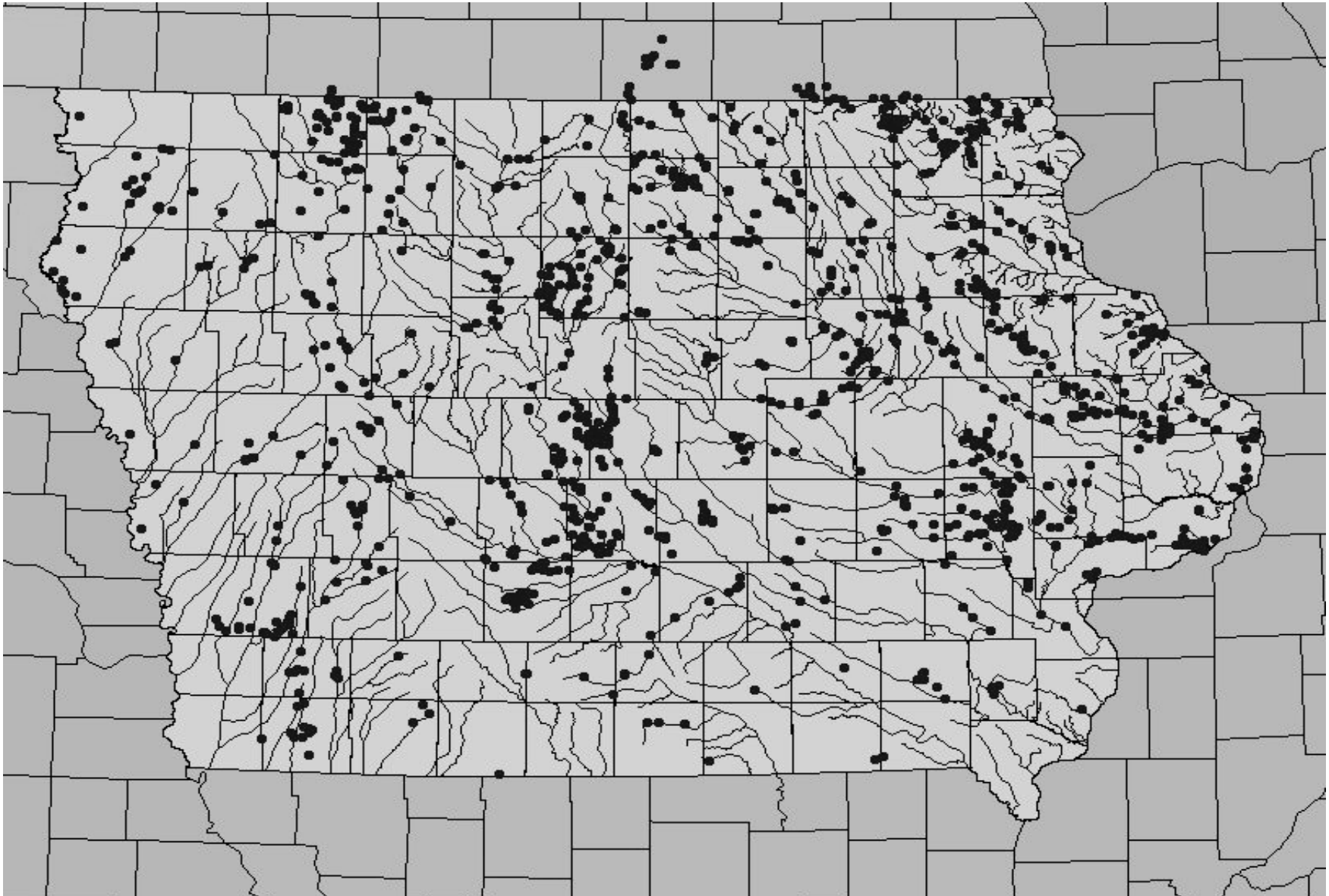
IOWATER Volunteer Monitoring

Education

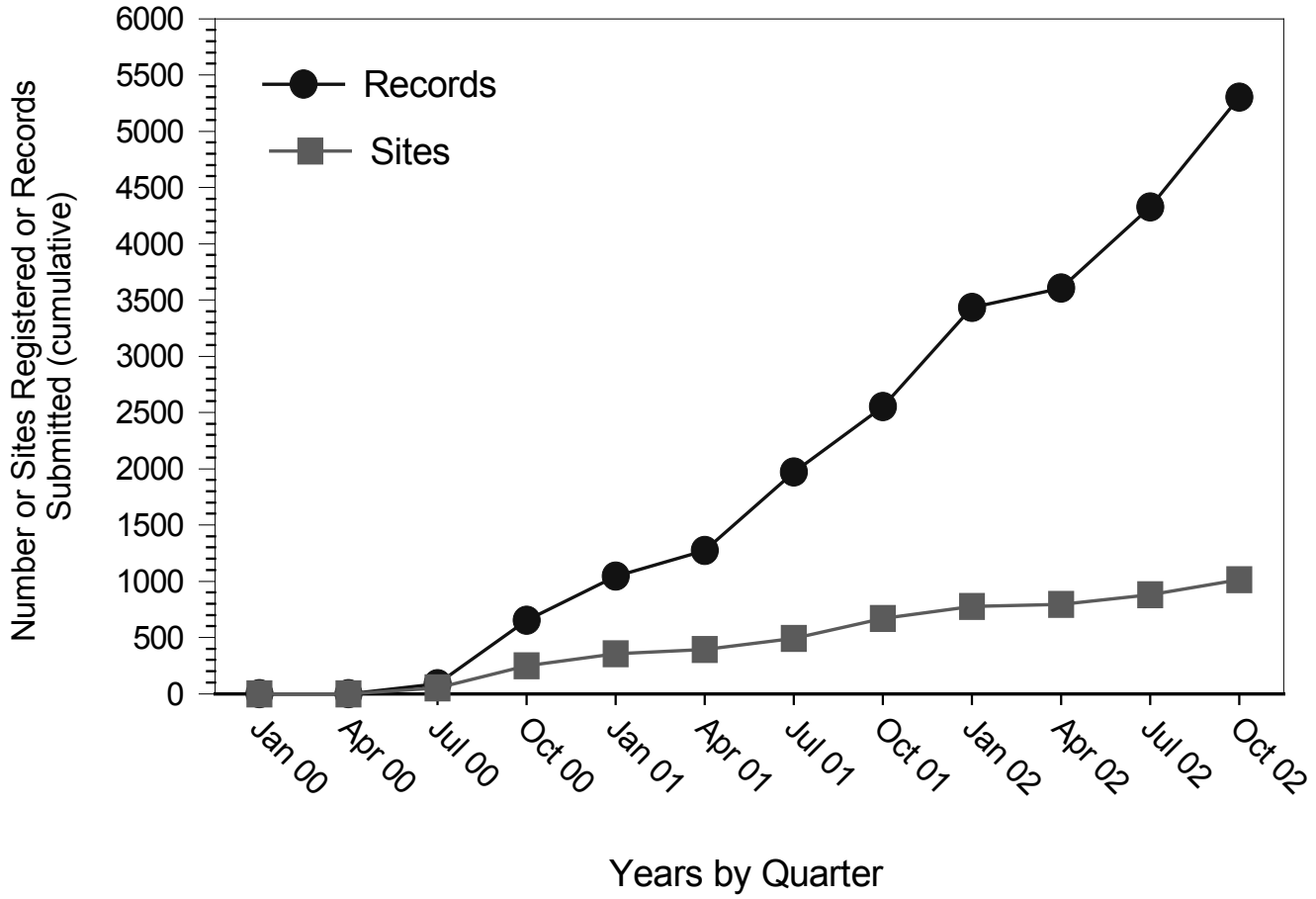
Filling in data gaps



IOWATER Volunteer Monitoring Sites



IOWATER Volunteer Monitoring Sites and Records



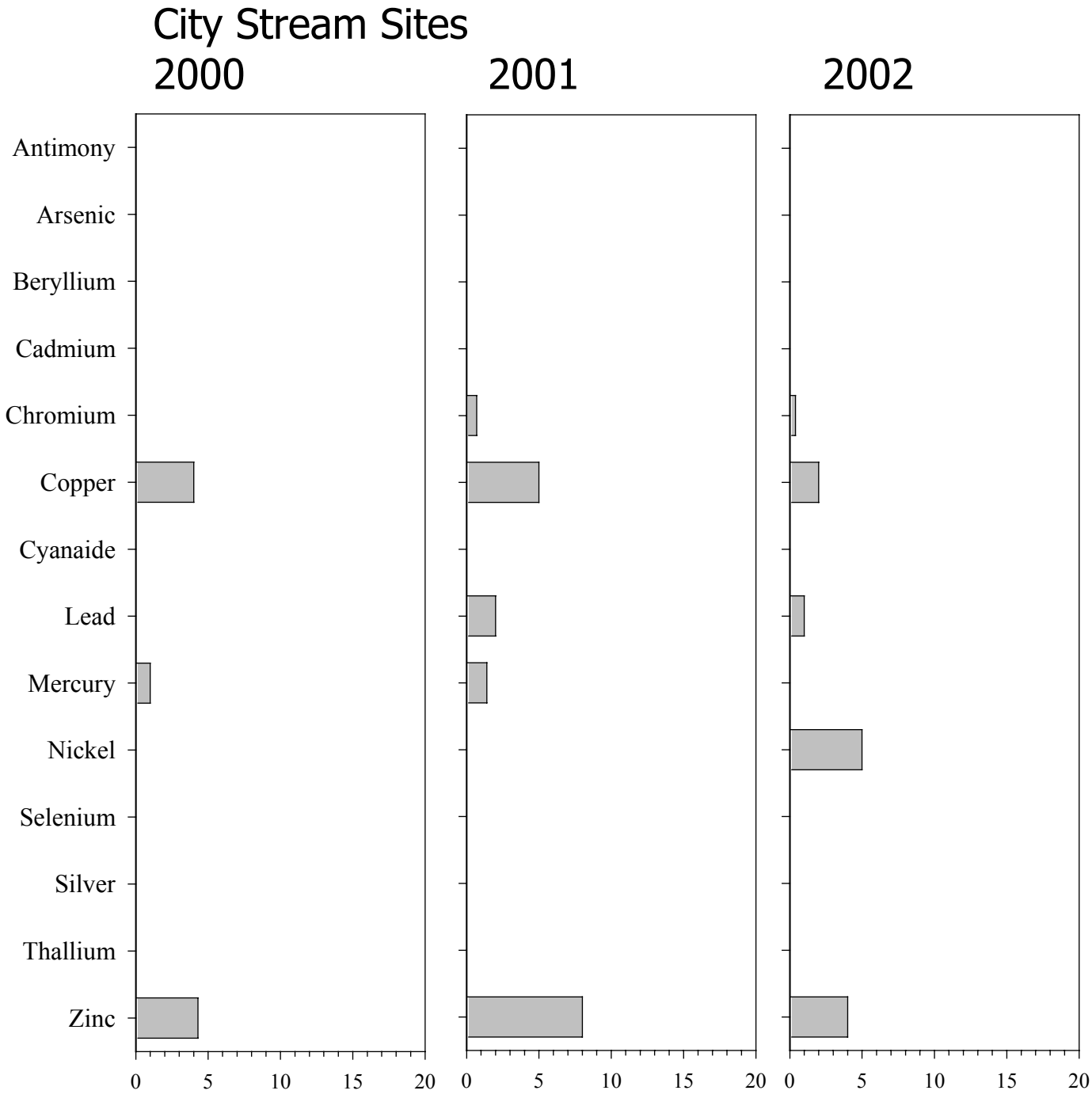
We have limited data, but what do we know about Iowa's water quality?

Some observations and trends

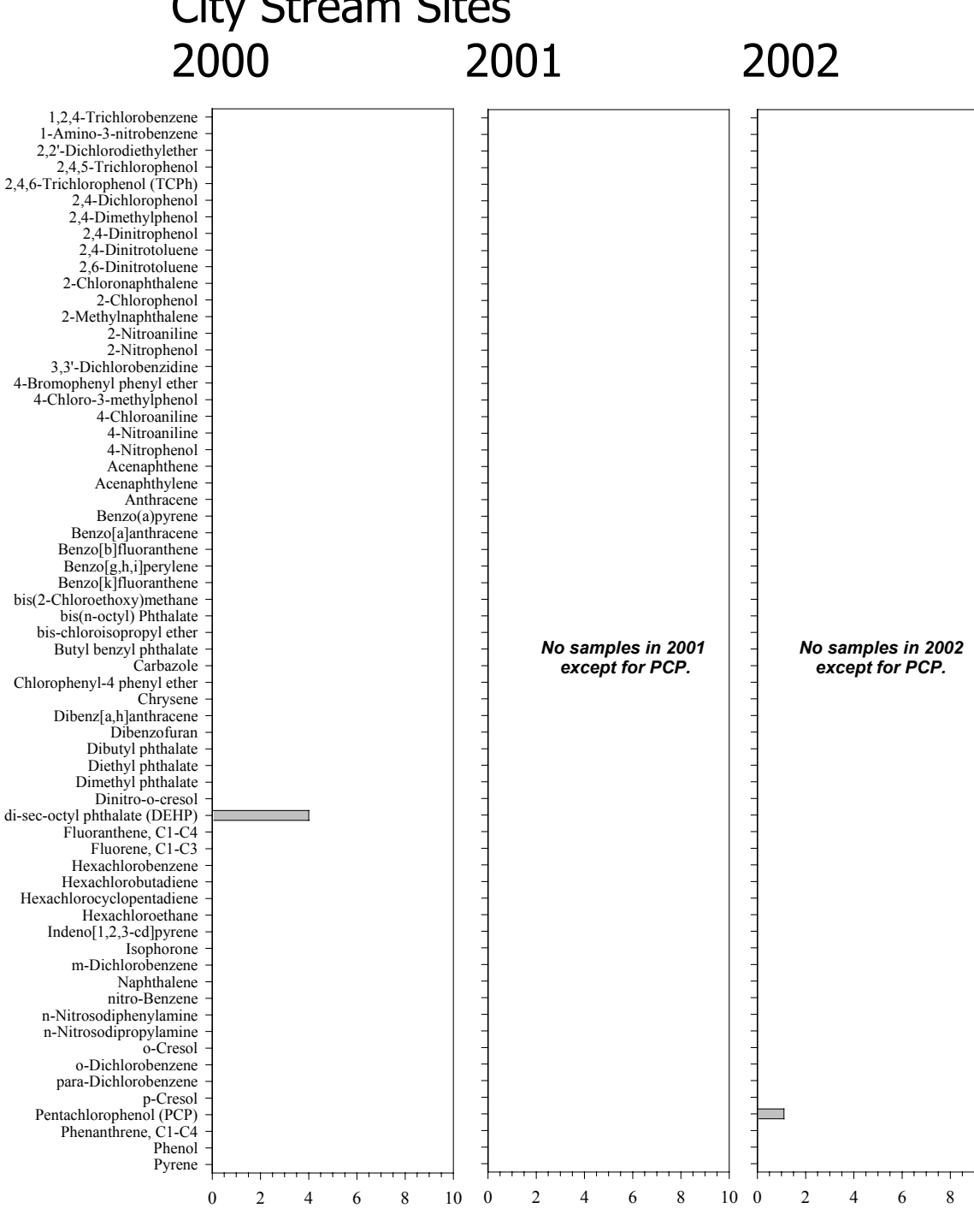
Industrial Pollutants

- Industrial pollutants
  - Metals
  - Synthetic organic compounds
  - Legacy pollutants (PCBs)
- Iowa has not had a large industrial base
- Industrial pollutants seldom detected

Metals


City Stream Sites
2000
2001
2002
Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Cyanaide
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc
0
5
10
15
20

Semi-Volatiles



Municipal/Industrial Wastewater Treatment - A Success Story

Iowa State Department of Health

December 1953

"Odebolt Creek for a distance of at least three miles was found to be grossly polluted. …unfit for normal stream uses. …unsuitable for livestock watering. A hazard exists … to persons coming in contact with the stream water."

February 1962

"Odebolt Creek and its tributary were found to be grossly polluted due to the discharge of milk processing wastes ... and inadequately treated sewage."

Municipal/Industrial Wastewater Treatment - A Success Story

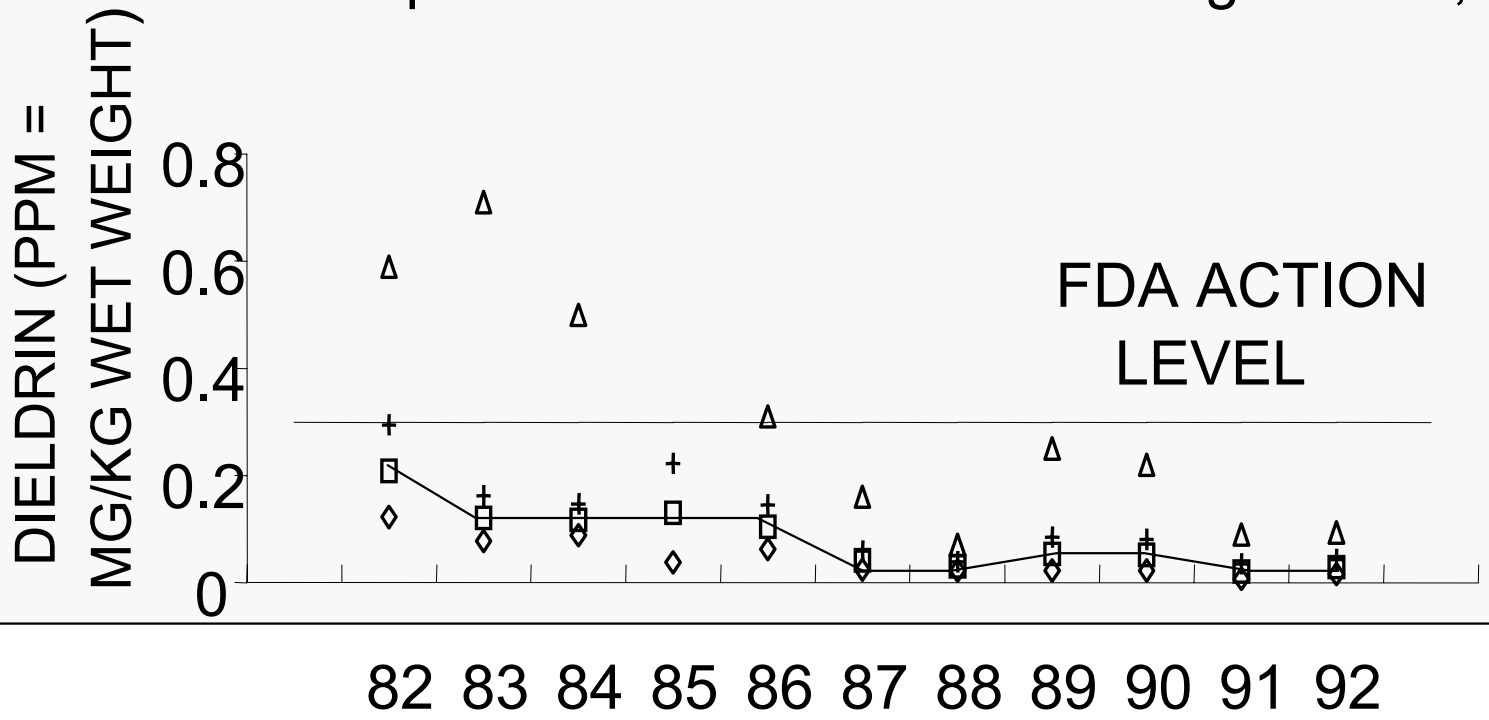
- Some issues still to be addressed
  - Upgrading
  - Meeting new, more stringent requirements
  - Aging infrastructure

Fish Tissue Testing

- 20 years of testing
- Almost all fish safe to eat
- Some pollutants found, but below level of health concern
- Mercury may be increasing – air deposition

Declines in Levels of Toxics in Fish

Yearly means of dieldrin (+/- two times standard error) in fillet & whole fish samples from U.S. EPA monitoring in Iowa, 1982-1992



Habitat is often as important or more important to “aquatic health” of waterbodies as chemical water quality

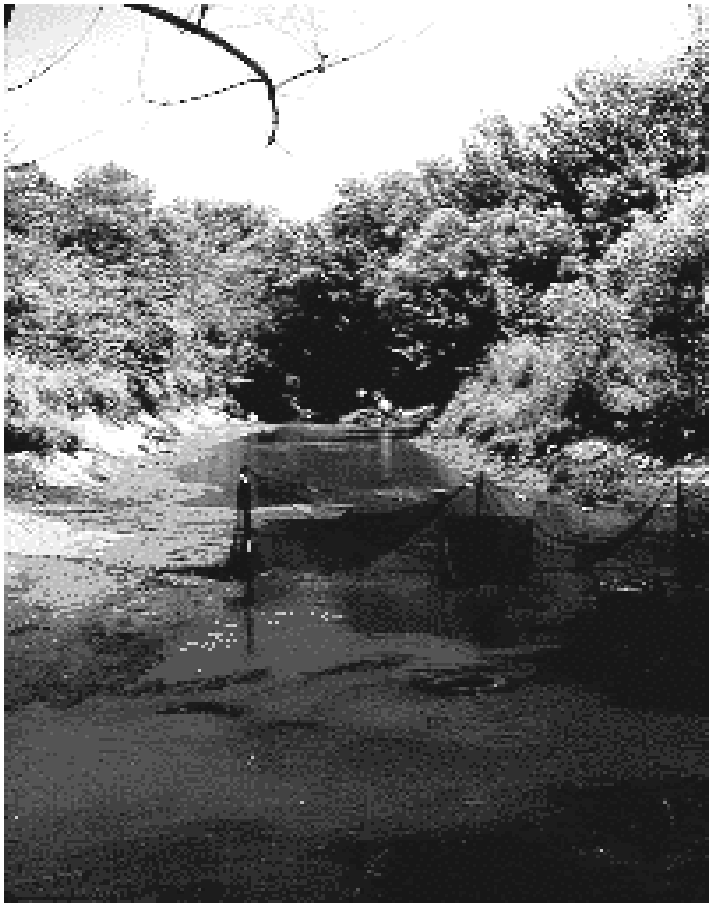
Habitat Modification

Channelization vs. Meandering

Stream Channelization

Chariton River/Channel Catfish

149 fish, 45 pounds



21 fish, 1 pound

Habitat – Bigalk Creek

Habitat destruction

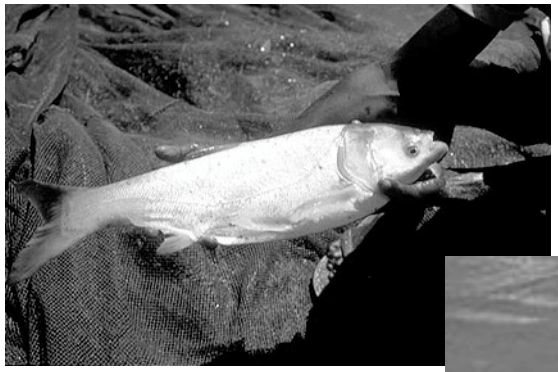
Habitat – Bigalk Creek

Habitat restoration

Less than $500

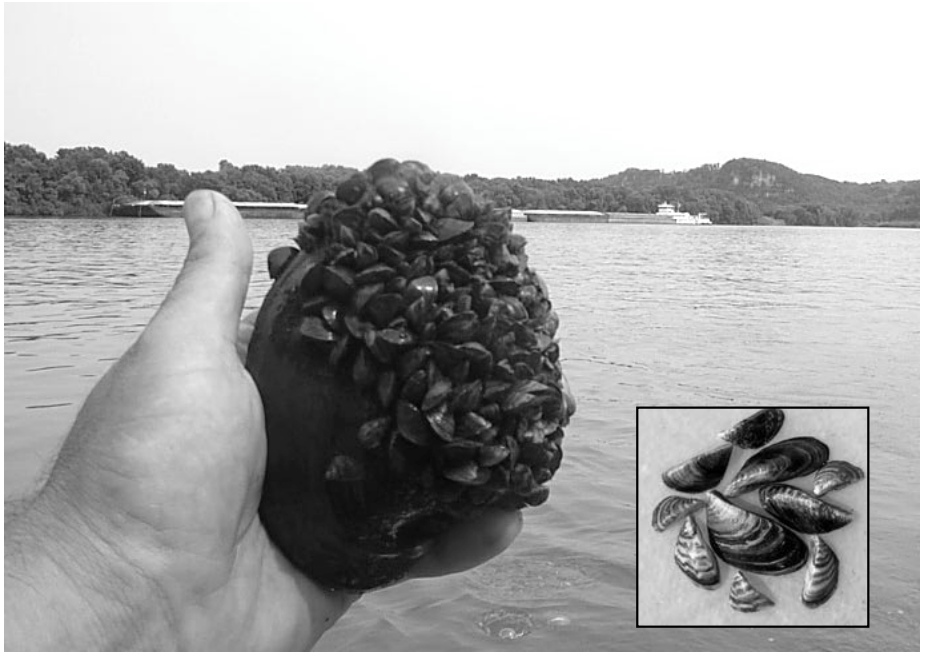
Invasive and exotic species have taken a toll, new ones appearing

Carp



Silver Carp

Purple Loosestrife



Zebra Mussel


Ventura Marsh After Fish Removal